PROBLEMS FOR SOLUTION.

ALGEBRA.

193. Errata. For $\sum \frac{a_i^2}{h_i^2}$ read $\sum \frac{a_i^2}{h_i}$.

195. Proposed by W. J. GREENSTREET, A. M., Editor of the Mathematical Gazette, Stroud, England.

Prove that when n is a positive integer,

$$\sum_{r=1}^{r=n} (-1)^r \, {}_nC_r \, 2^{n-r} \, r^2 = n^2 - 2n.$$

196. Proposed by L. E. NEWCOMB, Los Gatos, California.

Find the rth term of $\left(x - \frac{1}{x}\right)^n \equiv z^n$ in terms of z.

197. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, O.

Solve $(18)^{4(2-x)} = (54\sqrt{2})^{3x-2}$.

GEOMETRY.

221. Proposed by L. E. DICKSON, Ph. D., Assistant Professor of Mathematics, The University of Chicago.

Construct a right triangle with given hypotenuse h, and having an inscribed square of side 12 with a side lying along the hypotenuse. Show further that the minimum value of h is 36, the triangle being then isosceles.

222. Proposed by G. B. M. ZERR, A. M., Ph. D., Parsons, W. Va.

At the ends of a focal chord CC' of a parabola are drawn the normal chords CD, $C'D'$. Prove that DD' is parallel to CC' and equal to three times its length.

223. Proposed by W. J. GREENSTREET, A. M., Editor of The Mathematical Gazette, Stroud, England.

Find a point C in a given line AB, so the lines joining C to the angular points of a triangle PQR coplanar with the given line may cut off on any line parallel to the given line and lying in the same plane two equal segments.

CALCULUS.

176. Proposed by B. F. FINKEL, A. M., M. Sc., 204 St. Marks Square, Philadelphia, Pa.

Show by any method, Riemann's excepted, that

$$\int_0^\infty e^{-x^2} \cos \frac{b^2}{x^2} dx = \tfrac{1}{2}\sqrt{(\pi)} e^{-b\sqrt{2}} \cos b\sqrt{2}.$$

177. Proposed by O. W. ANTHONY, Head of Mathematical Department, DeWitt Clinton High School, New York City.

Find the volume of the minimum cone which can be circumscribed about a hemisphere.